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First Named Inventor	Barry L. Berson
Art Unit	2621
Examiner Name	Czekaj, David J.
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ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
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- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Koestner Bertani LLP		
Signature	/Mary Jo Bertani/		
Printed name	Mary Jo Bertani		
Date	November 11, 2009	Reg. No.	42,321

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Signature	/Mary Jo Bertani/		
Typed or printed name	Mary Jo Bertani	Date	June 7, 2010

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Barry L. Berson, Larry J. Bialecki, and Peter A. Buck		
Assignee:	Supersonic Aerospace International, LLC		
Title:	SYSTEM AND METHOD FOR MOUNTING SENSORS AND CLEANING SENSOR APERTURES FOR OUT-THE-WINDOW DISPLAY		
Serial No.:	10/706,672	Filing Date:	November 11, 2003
Examiner:	Czekaj, David J	Group Art Unit:	2621
Docket No.:	SAI.P005 US	Confirmation No.:	8313

Irvine, California
June 7, 2010

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APPELLANT'S BRIEF

Dear Sir:

This paper is responsive to the Non-Final Office Action dated February 19, 2010, to which a Notice of Appeal was filed on June 7, 2010 setting a time for response that expires August 7, 2010. The Notice of Appeal and Appeal Brief fees have been previously submitted. Reconsideration is respectfully requested.

I. REAL PARTY IN INTEREST

The entire interest in the present application has been assigned to Supersonic Aerospace International, LLC, a Nevada Limited Liability Company, having a place of business at 2250 E. Tropicana Avenue, Suite 19-121, Las Vegas, NV 89119.

II. RELATED APPEALS AND INTERFERENCES

No other appeals or interferences are known to the appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-33 are pending in the application.

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sankrithi *et al*. (6405975) in view of Ramachandran *et al*. (6259475) in further view of Keirstead (6693519).

Claims 16-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sankrithi *et al*. (6405975) in view of Ramachandran *et al*. (6259475) in further view of Jamieson *et al*. (6665063).

The rejection of claims 1-33 is on appeal.

IV. STATUS OF AMENDMENTS

The Appellant's response dated May 4, 2009, in response to the non-final office action dated February 2, 2009, was entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 pertains to a visual display system (50) (FIG. 5A) for a vehicle, comprising:

at least one sensor (14, FIG. 3), (54, 56, 58, FIG. 5A) operable to capture images representing scenery outside the vehicle; (specification paragraphs [0030] lines 2-8, [0031] lines 4-11)

a protective housing (12, 12A, 12B) (FIGs. 1, 4) enclosing the at least one sensor, wherein the protective housing further comprises a transparent aperture (20, FIG. 4) through which the at least one sensor captures images, wherein the transparent aperture further comprises a transparent conical surface that rotates about a drive shaft along the axis of the conical surface; (specification paragraphs [0029] lines 1-4, [0030] lines 5-13)

a cleaning mechanism (24, FIG. 4) operable to remove obstructions from the transparent aperture without interfering with the field of view of the at least one sensor; (specification paragraph [0030] lines 5-13) and

an operator display (80) (FIG. 5A), (100, FIG. 5B) through which images representing scenery outside the vehicle are displayed (specification paragraph [0033] lines 5-11).

Independent claim 8 pertains to a visual display system (50) (FIG. 5A) for a vehicle, comprising:

at least one sensor (14, FIG. 3), (54, 56, 58, FIG. 5A) operable to capture images representing scenery outside the vehicle; (specification paragraphs [0030] lines 2-8, [0031] lines 4-11)

a protective housing (12, 12A, 12B) (FIGs. 1, 4) enclosing the at least one sensor, wherein the protective housing further comprises a transparent aperture (20, FIG. 4) through which the at least one sensor captures images, wherein the transparent aperture further comprises a conical surface that rotates about a drive shaft along the axis of the conical surface; (specification paragraphs [0029] lines 1-4, [0030] lines 5-13)

a cleaning mechanism (24, FIG. 4) operable to remove obstructions from an outer surface of the transparent aperture, wherein the cleaning mechanism is located within the protective housing and outside of a field of view of the at least one sensor; (specification paragraph [0030] lines 5-13) and

an operator display (80) (FIG. 5A), (100, FIG. 5B) through which images representing scenery outside the vehicle are displayed, and wherein the images representing scenery outside the vehicle are derived from captured images from the at least one sensor (specification paragraph [0033] lines 5-11).

Independent claim 14 pertains to a method for providing an out-the-window visual scene on a display device within a vehicle, comprising:

capturing images representing scenery outside the vehicle with at least one sensor (14, FIG. 3), (54, 56, 58, FIG. 5A), wherein a protective housing (12, 12A, 12B) (FIGs. 1, 4) encloses the at least one sensor behind a transparent aperture (20, FIG. 4), wherein the transparent aperture further comprises a conical surface that rotates about the axis of the conical surface; (specification paragraphs [0029] lines 1-4, [0030] lines 2-13, [0031] lines 4-11)

cleaning the transparent aperture of the protective housing to remove obstructions to a field of view of the at least one sensor (specification paragraph [0030] lines 5-13);

sending images of a portion of the out-the-window visual scene from the viewpoint of the at least one sensor (specification paragraph [0031];

generating an image of the scenery outside the vehicle from the captured images (specification paragraph [0033];

outputting image of the scenery outside the vehicle to a first display device (80) (FIG. 5A) (100, FIG. 5B), wherein the display device is positioned to provide the portion of a desired out-the window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene (specification paragraphs [0033] lines 5-11, [0038]-[0040]).

Independent claim 19 pertains to a device, comprising:

a display device (80) (FIG. 5A) (100, FIG. 5B);

a transparent aperture including a conical surface that rotates about the axis of the conical surface; (specification paragraphs [0029] lines 1-4, [0030] lines 2-13, [0031] lines 4-11) and

a display processor (52, FIG. 5A) operable to:

receive a first sensor image representing a portion of scenery outside the device from a sensor (14, FIG. 3), (54, 56, 58, FIG. 5A) located within a protective housing (12, 12A, 12B) (FIGs. 1, 4) and behind the transparent aperture (20, FIG. 4), wherein a cleaning mechanism (24, FIG. 4) cleans the transparent aperture of the protective housing to remove obstructions to the sensor's field of view (specification paragraphs [0029] lines 1-4, [0030] lines 5-13, [0033] lines 5-11);

transform the first sensor image to a viewpoint image from an operator station in the device, wherein the viewpoint image is sized and oriented to conform to the scenery outside the device from the operator station (specification paragraphs [0033] lines 3-4, [0043] lines 8-11); and

output the first operator viewpoint image to the display device, wherein the display device is positioned to provide the portion of a desired out-the window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene (specification paragraph [0038]).

Independent claim 31 pertains to an aircraft, comprising:

a crewstation with cockpit windows (204) (FIGs. 6, 7);

a first display device (80) (FIG. 5A) (100, FIG. 5B) for one crewmember;

a second display device (80) (FIG. 5A) (100, FIG. 5B) for another crewmember;

a first transparent aperture including a conical surface that rotates about the axis of the conical surface (20, FIG. 4);

a first cleaning mechanism (24) (FIG. 4) configured to clean the first transparent aperture to remove obstructions to a first sensor's field of view; and

a display processor (52, FIG. 5A) operable to:

receive an image of an out-the-window visual scene from the viewpoint of a first sensor (14, FIG. 4), (54, 56, 58, FIG. 5A) located within a first protective housing (12, 12A, 12B) (FIGs. 1, 4) and behind the first transparent aperture (20, FIG. 4), wherein a first cleaning mechanism (24, FIG. 4) cleans the first transparent aperture to remove obstructions to the first sensor's field of view without interfering with the field of view of the first sensor (specification paragraphs [0029] lines 1-4, [0030] lines 5-13, [0033] lines 5-11);

receive another image of a portion of the out-the-window visual scene from the viewpoint of a second sensor (14, FIG. 3), (54, 56, 58, FIG. 5A) located within a second protective housing and behind a second transparent aperture, wherein a second cleaning mechanism (24, FIG. 4) cleans the second transparent aperture of the second protective housing to remove obstructions to the second sensor's field of view without interfering with the field of view of the second sensor (specification paragraphs [0029] lines 1-4, [0030] lines 5-13, [0033] lines 5-11);

fuse the images from the first and second sensors into a combined image to generate a first fused image (specification paragraph [0033]);

transform the fused image to a first operator viewpoint and to a second operator viewpoint (specification paragraph [0033]);

transform the first operator viewpoint image and the second operator viewpoint image to conform to the size and orientation of the out-the-window visual scene (specification paragraphs [0033] lines 3-4, [0043] lines 8-11); and

output the first operator viewpoint image to the first display device and the second operator viewpoint image to the second display device (specification paragraph [0038]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-15 are unpatentable under 35 U.S.C. 103(a) over Sankrithi *et al*. (6405975) in view of Ramachandran *et al*. (6259475) in further view of Keirstead (6693519).

2. Whether claims 16-33 are unpatentable under 35 U.S.C. 103(a) over Sankrithi *et al*. (6405975) in view of Ramachandran *et al*. (6259475) in further view of Jamieson *et al*. (6665063).

VII. ARGUMENT

Claim Rejections Under 35 U.S.C. 103

Claims 1-15 are patentable under 35 U.S.C. 103(a) over Sankrithi et al. (6405975), (hereinafter referred to as "Sankrithi") in view of Ramachandran et al. (6259475), (hereinafter referred to as "Ramachandran") in further view of Keirstead (6693519) because the cited references do not include all the claim limitations nor does the combination of references have any reasonable expectation of success.

Claims 1-7

Independent claim 1 recites

"at least one sensor operable to capture images representing scenery outside the vehicle;
a protective housing enclosing the at least one sensor, wherein the protective housing further comprises a transparent aperture through which the at least one sensor captures images, wherein the transparent aperture further comprises a transparent conical surface that rotates about a drive shaft along the axis of the conical surface;
a cleaning mechanism operable to remove obstructions from the transparent aperture without interfering with the field of view of the at least one sensor". (Emphasis added).

In contrast, the aperture 450 of Sankrithi is a slightly curved lens at one end of housing 438 that is cleaned by a rubbery squeegee type cleaner 454 as the opposite end of

housing 438 rotates at pin 442. (See Sankrithi FIG.11 and col. 9 lines 1-15). If the lens in Sankrithi is replaced with the bullet shaped nose portion 362 of housing 360 in Ramachandran as suggested in paragraph 1 of the Office Action, only the tip of the bullet shaped nose portion 362 would be cleaned, as shown below in FIG. 11 of Sankrithi modified with the bullet shaped nose portion 362 of Ramachandran replacing lens 450 of Sankrithi (labeled as element 362/450 in Fig. 11 below). Squeegee 454 can only clean nose portion 362 when housing 438 rotates upward or downward, thereby changing the field of view of the sensor. Additionally, when housing 438 rotates upward, the field of view of the sensor will be blocked. The combination of Sankrithi and Ramachandran does not teach all of the claim limitations because cleaning the tip of nose portion 362 interferes with the field of view of the sensor.

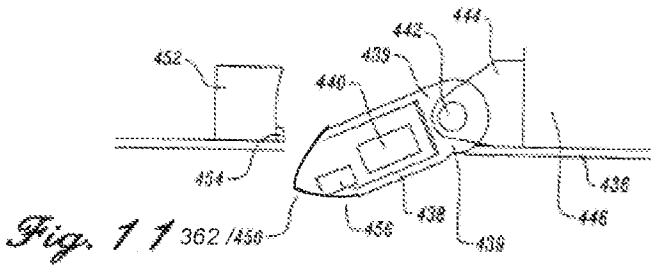

Fig. 11

Sankrithi FIG. 11 Modified As Suggested By Examiner

Further, if any other portion beside the tip of the bullet shaped nose were dirty, the squeegee in Sankrithi would not be able to remove obstructions from the transparent aperture so that the sensor 456 could capture images, as required in claim 1.

The Examiner states that Sankrithi alternatively discloses using a cleaning solution of air with water or antifreeze. (Final Office Action dated May 1, 2008, page 2 lines 6-10). Sankrithi does not disclose or suggest any mechanism to dispense the cleaning solution without interfering with the field of view of the sensor, however.

Additionally, the nose portion in Ramachandran is not fabricated from transparent material and the cylindrical portions 370 (FIG. 10 in Ramachandran) protruding from the nose portion would interfere with the line of sight of the sensor.

Still further, it is well-known in basic geometry that a conical surface is formed about an axis of symmetry. (See Evidence Appendix attached hereto, "Cone (geometry)", http://en.wikipedia.org/wiki/Cone_(geometry), second paragraph). Claim 1 recites "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface". In contrast, FIG. 11 of Sankrithi modified with the bullet shaped nose portion 362 of Ramachandran replacing lens 450 of Sankrithi as shown above does not rotate along the axis of the conical surface (bullet shaped nose portion). Keirstead is cited in combination with Sankrithi and Ramachandran as teaching "rotating a drive shaft about an axis of the surface". (Office Action dated Feb. 19, 2010, page 4 lines 4-6). None of the cited references, alone or in combination, teach or suggest "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface" as recited in claim 1. Instead, Keirstead teaches a camera securing means that provides conical rotation of a screw to provide alternative positioning of a video camera, as shown in Fig. 3 from Keirstead below. (Keirstead, col. [4] 6, lines 23-27).

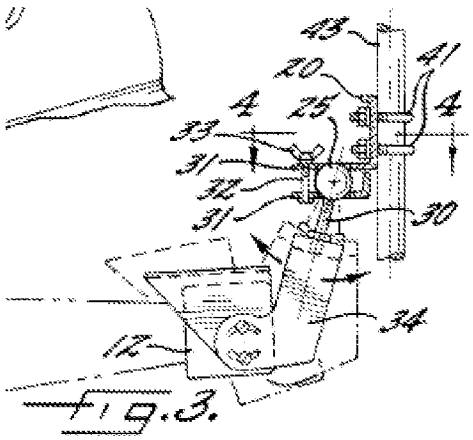

FIG. 3.

Thus, for at least these reasons, the cited references do not include all the claim limitations nor does the combination have any reasonable expectation of success. The references therefore do not anticipate or make obvious the features set forth in claim 1.

Claims 2-7 depend from claim 1 and include features that further distinguish them from the cited references.

Claims 8-13

Independent claim 8 recites

"a protective housing enclosing the at least one sensor, wherein the protective housing further comprises a transparent aperture through which the at least one sensor captures images, wherein the transparent aperture further comprises a conical surface that rotates about a drive shaft along the axis of the conical surface;
a cleaning mechanism operable to remove obstructions from an outer surface of the transparent aperture, wherein the cleaning mechanism is located within the protective housing and outside of a field of view of the at least one sensor". (Emphasis added).

Claim 8 is distinguishable from the cited references for reasons similar to those stated above for claim 1. In particular, the combination of Sankrithi and Ramachandran does not teach all of the claim limitations because the squeegee 454 will not be outside the field of view of the sensor during the cleaning process as the housing 438 rotates upward.

Further, if any other portion beside the tip of the bullet shaped nose were dirty, the squeegee in Sankrithi would not be able to remove obstructions from the aperture so that the sensor 456 could capture images representing scenery outside the vehicle, as required in claim 8.

The Examiner states that Sankrithi alternatively discloses using a cleaning solution of air with water or antifreeze. (Final Office Action dated August 5, 2009, page 2 lines 6-10). Sankrithi does not disclose or suggest any mechanism to dispense the cleaning solution without interfering with the field of view of the sensor, however. Also, simply spraying a surface with a liquid typically does not clean a surface; the liquid is used to loosen dirt while a brush or squeegee is typically used to wipe the dirt off the surface.

Note further, the wiper blade 472 and washer nozzle 474 shown in Fig. 12 of Sankrithi and referred to on page 2 of the Final Office Action dated August 5, 2009, is not located within the protective housing and outside of the field of view of the sensor, as recited in claim 8.

Additionally, the nose portion in Ramachandran is not fabricated from transparent material and the cylindrical portions 370 (FIG. 10 in Ramachandran) protruding from the nose portion would interfere with the line of sight of the sensor. Thus, the cited references do not anticipate or make obvious the features set forth in claim 8.

Still further, it is well-known in basic geometry that a conical surface is formed about an axis of symmetry. (See Evidence Appendix attached hereto, "Cone (geometry)", http://en.wikipedia.org/wiki/Cone_(geometry), second paragraph). Claim 1 recites "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface". In contrast, FIG. 11 of Sankrithi modified with the bullet shaped nose portion 362 of Ramachandran replacing lens 450 of Sankrithi as shown above does not rotate along the axis of the conical surface (bullet shaped nose portion). Keirstead is cited in combination with Sankrithi and Ramachandran as teaching "rotating a drive shaft about an axis of the surface". (Office Action dated Feb. 19, 2010, page 4 lines 4-6). None of the cited references, alone or in combination, teach or suggest "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface" as recited in claim 8. Instead, Keirstead teaches a camera securing means that provides conical rotation of a screw to provide alternative positioning of a video camera, as shown in Fig. 3 from Keirstead below. (Keirstead, col. [4] 6, lines 23-27).

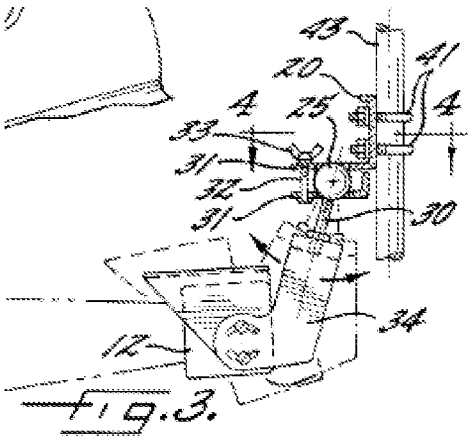

FIG. 3.

Thus, for at least these reasons, the cited references do not include all the claim limitations nor does the combination have any reasonable expectation of success. The references therefore do not anticipate or make obvious the features set forth in claim 8.

Claims 9-13 depend from claim 8 and include features that further distinguish them from the cited references.

Claims 14-18

Independent claim 14 recites "outputting image of the scenery outside the vehicle to a first display device, wherein the display device is positioned to provide the portion of a desired out-the window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene." The claimed configuration is shown at least in FIG. 5B and described at least in paragraph [0038] of the present application. In contrast, the cited figure 6A of Sankrithi shows multiple display devices showing different portions of the landing gear, but the display devices do not provide a portion of the desired out-the-window scene in combination with a window that provides another portion of the out-the-window scene. In Sankrithi, the scenes of the landing gear on the display devices is not the same as the out-the-window view provided by the window. Although the display devices in Sankrithi show different portions of the landing gear, Sankrithi differs from claim 14, which requires that the display device and the window show different portions of the desired out-the-window scene, not multiple scenes (i.e., the landing gear scene and the out-the-window scene). Appellant submits use of the antecedent "the" removes the possibility that claim 14 can be interpreted to include any other scene except the desired out-the-window scene. Claim 14 is distinguishable from Sankrithi for at least these reasons.

Still further, it is well-known in basic geometry that a conical surface is formed about an axis of symmetry. (See Evidence Appendix attached hereto, "Cone (geometry)", http://en.wikipedia.org/wiki/Cone_(geometry), second paragraph). Claim 14 recites "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface". In contrast, FIG. 11 of Sankrithi modified with the bullet shaped nose portion 362 of Ramachandran replacing lens 450 of Sankrithi as shown above

does not rotate along the axis of the conical surface (bullet shaped nose portion). Keirstead is cited in combination with Sankrithi and Ramachandran as teaching "rotating a drive shaft about an axis of the surface". (Office Action dated Feb. 19, 2010, page 4 lines 4-6). None of the cited references, alone or in combination, teach or suggest "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface" as recited in claim 14. Instead, Keirstead teaches a camera securing means that provides conical rotation of a screw to provide alternative positioning of a video camera, as shown in Fig. 3 from Keirstead below. (Keirstead, col. [4] 6 lines 23-27).

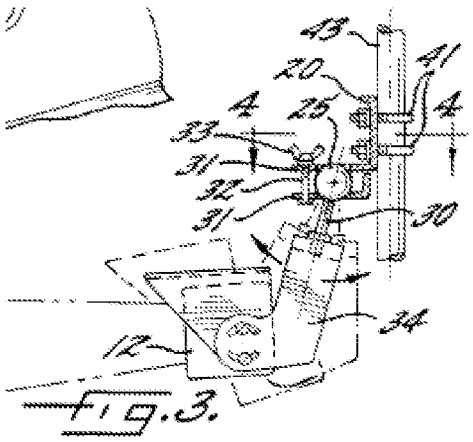

FIG. 3.

Thus, for at least these reasons, the cited references do not include all the claim limitations nor does the combination have any reasonable expectation of success. The references therefore do not anticipate or make obvious the features set forth in claim 14.

Claims 15-18 depend from claim 14 and include features that further distinguish them from the prior art.

Claims 19-30

Claims 19-30 are patentable under 35 U.S.C. 103(a) over Sankrithi in view of Ramachandran, in further view of Keirstead, in further view of Jamieson *et al.* (6665063), (hereinafter referred to as "Jamieson") because the cited references do not include all the claim limitations nor does the combination have any reasonable expectation of success.

Independent claim 19 recites features similar to claim 14, specifically "output the first operator viewpoint image to the display device, wherein the display device is positioned to provide the portion of a desired out-the window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene." The claimed configuration is shown at least in FIG. 5B and described at least in paragraph [0038] of the present application. In contrast, the cited figures 16A and 16B of Sankrithi describe a method for determining where a reference within a field of view should be located in a camera image and displaying a target with the camera image. The Sankrithi method does not provide a portion of the desired out-the-window scene in combination with a window that provides another portion of the same out-the-window scene. In Sankrithi, the scenes of the landing gear on the display devices is not the same as the out-the-window view provided by the cockpit window. (Sankrithi Figure 17) Although the display devices in Sankrithi show different portions of the landing gear, Sankrithi differs from claim 19, which requires that the display device and the window show different portions of the [same] scene. Appellant submits use of the antecedent "the" removes the possibility that claim 19 can be interpreted to include any other scene except the desired out-the-window scene.

Still further, it is well-known in basic geometry that a conical surface is formed about an axis of symmetry. (See Evidence Appendix attached hereto, "Cone (geometry)", http://en.wikipedia.org/wiki/Cone_(geometry), second paragraph). Claim 19 recites "a conical surface that rotates about the axis of the conical surface". In contrast, FIG. 11 of Sankrithi modified with the bullet shaped nose portion 362 of Ramachandran replacing lens 450 of Sankrithi as shown above does not rotate about

the axis of the conical surface (bullet shaped nose portion). Keirstead is cited in combination with Sankrithi and Ramachandran as teaching "rotating a drive shaft about an axis of the surface". (Office Action dated Feb. 19, 2010, page 4 lines 4-6). None of the cited references, alone or in combination, teach or suggest "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface" as recited in claim 19. Instead, Keirstead teaches a camera securing means that provides conical rotation of a screw to provide alternative positioning of a video camera, as shown in Fig. 3 from Keirstead below. (Keirstead, col. [4] 6 lines 23-27).

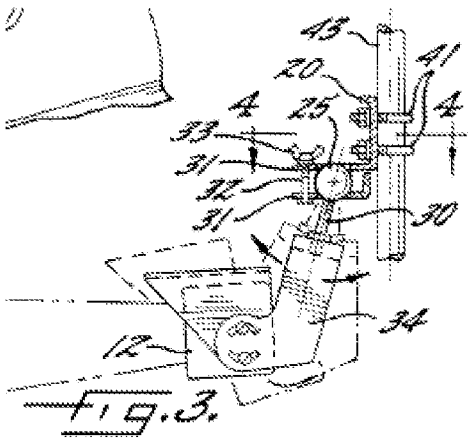

FIG. 3.

Thus, for at least these reasons, the cited references do not include all the claim limitations nor does the combination have any reasonable expectation of success. The references therefore do not anticipate or make obvious the features set forth in claim 19.

Claims 20-30 depend from claim 19 and include features that further distinguish from the prior art. For example, claim 30 recites "generate a common display area associated with two mutually exclusive windows of information on the display device, the area being customized by the operator to display detailed information". In contrast, the cited portion of Sankrithi does not show the common display area on the same display device as the two mutually exclusive windows of information, as required in

claim 30. Claim 30 is further distinguishable from Sankrithi for at least these additional reasons.

Claims 31-33

Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sankrithi in view of Ramachandran, in further view of Keirstead, in further view of Jamieson. Claim 31 as amended recites "a first cleaning mechanism cleans the first transparent aperture to remove obstructions to the first sensor's field of view without interfering with the field of view of the first sensor" and is distinguishable from the cited references for reasons similar to those stated above for claim 1. In particular, the cited references, alone or in combination, do not teach all of the claim limitations because the squeegee 454 interferes with the field of view of the sensor during the cleaning process.

Further, if any other portion beside the tip of the bullet shaped nose were dirty, the squeegee in Sankrithi would not be able to remove obstructions from the aperture so that the sensor 456 could capture images representing scenery outside the vehicle, as required in claim 31.

Additionally, the nose portion in Ramachandran is not fabricated from transparent material and the cylindrical portions 370 (FIG. 10 in Ramachandran) protruding from the nose portion would interfere with the line of sight of the sensor. Squeegee 454 can only clean nose portion 362 when housing 438 rotates upward or downward, thereby changing the field of view of the sensor.

The Examiner states that Sankrithi alternatively discloses using a cleaning solution of air with water or antifreeze. (Final Office Action dated August 5, 2009, page 2 lines 6-10). Sankrithi does not disclose or suggest any mechanism to dispense the cleaning solution without interfering with the field of view of the sensor, however. Also, simply spraying a surface with a liquid typically does not clean a surface; the liquid is used to loosen dirt while a brush or squeegee is typically used to wipe the dirt off the surface.

Note further, the wiper blade 472 and washer nozzle 474 shown in Fig. 12 of Sankrithi and referred to on page 2 of the Final Office Action dated August 5, 2009, is not located within the protective housing and outside of the field of view of the sensor, as recited in claim 31.

Additionally, when housing 438 rotates upward, the field of view of the sensor will be blocked. The combination of Sankrithi and Ramachandran does not teach all of the claim limitations because cleaning the tip of nose portion 362 interferes with the field of view of the sensor. Thus, the cited references do not anticipate or make obvious the features set forth in claim 31.

Still further, it is well-known in basic geometry that a conical surface is formed about an axis of symmetry. (See Evidence Appendix attached hereto, "Cone (geometry)", http://en.wikipedia.org/wiki/Cone_(geometry), second paragraph). Claim 1 recites "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface". In contrast, FIG. 11 of Sankrithi modified with the bullet shaped nose portion 362 of Ramachandran replacing lens 450 of Sankrithi as shown above does not rotate along the axis of the conical surface (bullet shaped nose portion). Keirstead is cited in combination with Sankrithi and Ramachandran as teaching "rotating a drive shaft about an axis of the surface". (Office Action dated Feb. 19, 2010, page 4 lines 4-6). None of the cited references, alone or in combination, teach or suggest "a transparent conical surface that rotates about a drive shaft along the axis of the conical surface" as recited in claim 31. Instead, Keirstead teaches a camera securing means that provides conical rotation of a screw to provide alternative positioning of a video camera, as shown in Fig. 3 from Keirstead below. (Keirstead, col. [4] 6 lines 23-27).

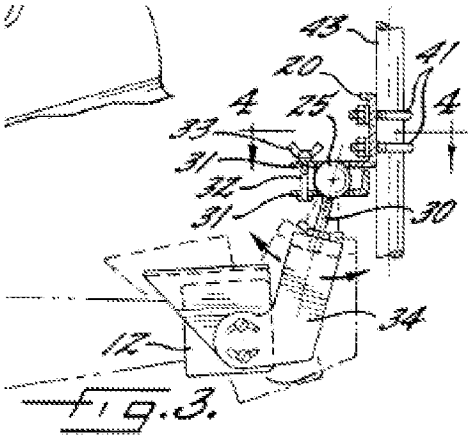

Fig. 3.

Thus, for at least these reasons, the cited references do not include all the claim limitations nor does the combination have any reasonable expectation of success. The references therefore do not anticipate or make obvious the features set forth in claim 31.

Claims 32-33 depend from claim 31 and include features that further distinguish from the prior art.

I hereby certify that this correspondence is being transmitted to the USPTO on the date shown below:

/Mary Jo Bertani/
(Signature)

Mary Jo Bertani
(Printed Name of Person Signing Certificate)

June 7, 2010
(Date)

Respectfully submitted,

/Mary Jo Bertani/

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VIII. CLAIMS APPENDIX

Claims remaining in the application are as follows:

1. A visual display system for a vehicle, comprising:

at least one sensor operable to capture images representing scenery outside the vehicle;

a protective housing enclosing the at least one sensor, wherein the protective housing further comprises a transparent aperture through which the at least one sensor captures images, wherein the transparent aperture further comprises a transparent conical surface that rotates about a drive shaft along the axis of the conical surface;

a cleaning mechanism operable to remove obstructions from the transparent aperture without interfering with the field of view of the at least one sensor; and

an operator display through which images representing scenery outside the vehicle are displayed.

2. (Original) The visual display system of Claim 1, wherein the at least one sensor further comprises a camera.

3. (Previously presented) The visual display system of Claim 1, wherein an outer surface of the transparent conical surface is wiped within the protective housing by the cleaning mechanism to remove obstructions from the transparent aperture.

4. (Original) The visual display system of Claim 3, wherein the cleaning mechanism is located to not obstruct the at least one sensor's field of view.

5. (Original) The visual display system of Claim 2, wherein the camera further comprises an infrared camera or low light camera.

6. (Original) The visual display system of Claim 3, wherein the cleaning mechanism further comprises a mechanical brush that removes obstructions from an outer surface of the transparent aperture.

7. (Original) The visual display system of Claim 3, wherein the cleaning mechanism further comprises a cleaning fluid applicator that applies cleaning solution to the transparent aperture.

8. (Currently amended) A visual display system for a vehicle, comprising:

at least one sensor operable to capture images representing scenery outside the vehicle;

a protective housing enclosing the at least one sensor, wherein the protective housing further comprises a transparent aperture through which the at least one sensor captures images, wherein the transparent aperture further comprises a conical surface that rotates about a drive shaft along the axis of the conical surface;

a cleaning mechanism operable to remove obstructions from an outer surface of the transparent aperture, wherein the cleaning mechanism is located within the protective housing and outside of a field of view of the at least one sensor; and

an operator display through which images representing scenery outside the vehicle are displayed, and wherein the images representing scenery outside the vehicle are derived from captured images from the at least one sensor.

9. (Original) The visual display system of Claim 1, wherein the at least one sensor further comprises a camera.

10. (Original) The visual display system of Claim 1, wherein the vehicle comprises an aircraft.

11. (Original) The visual display system of Claim 9, wherein the camera further comprises an infrared camera or low light camera.

12. (Original) The visual display system of Claim 8, wherein the cleaning mechanism further comprises a mechanical brush that removes obstructions from an outer surface of the transparent aperture.

13. (Original) The visual display system of Claim 12, wherein the cleaning mechanism further comprises a cleaning fluid applicator that applies cleaning solution to the transparent aperture.

14. A method for providing an out-the-window visual scene on a display device within a vehicle, comprising:

capturing images representing scenery outside the vehicle with at least one sensor, wherein a protective housing encloses the at least one sensor behind a transparent aperture, wherein the transparent aperture further comprises a conical surface that rotates about the axis of the conical surface;

cleaning the transparent aperture of the protective housing to remove obstructions to a field of view of the at least one sensor;

sending images of a portion of the out-the-window visual scene from the viewpoint of the at least one sensor;

generating an image of the scenery outside the vehicle from the captured images;

outputting image of the scenery outside the vehicle to a first display device, wherein the display device is positioned to provide the portion of a desired out-the window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene.

15. (Original) The method of Claim 14, further comprising capturing images representing scenery outside the vehicle with a second sensor, wherein a protective housing encloses the second sensor behind a transparent aperture.

16. (Original) The method of Claim 15, wherein images from the at least one sensor and the second sensor are fused to create a first fused image.

17. (Original) The method of Claim 16, further comprising combining the first fused image with symbols representing objects.

18. (Original) The method of Claim 16, further comprising fusing the first fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

19. A device, comprising:

a display device;

a transparent aperture including a conical surface that rotates about the axis of the conical surface; and

a display processor operable to:

receive a first sensor image representing a portion of scenery outside the device from a sensor located within a protective housing and behind the transparent aperture, wherein a cleaning mechanism cleans the transparent aperture of the protective housing to remove obstructions to the sensor's field of view;

transform the first sensor image to a viewpoint image from an operator station in the device, wherein the viewpoint image is sized and oriented to conform to the scenery outside the device from the operator station; and

output the first operator viewpoint image to the display device, wherein the display device is positioned to provide the portion of a desired out-the window visual scene in combination with a window that

provides another portion of the desired out-the-window visual scene.

20. The device of Claim 19, wherein the display processor is further operable to combine the viewpoint image with symbols, wherein the symbols represent information regarding the operational state of the device and the moving objects detected in the images.

21. (Original) The device of Claim 20, wherein the display processor is further operable to generate symbols representing moving objects in the sensor image and the operational state of the device.

22. (Original) The device of Claim 20, wherein the display processor is further operable to generate symbols representing weather hazards in the vicinity of the device.

23. (Original) The device of Claim 20, wherein the display processor is further operable to receive an enhanced image of the out-the-window scenery in low-visibility conditions from a second sensor.

24. (Original) The device of Claim 23, wherein the display processor is further operable to fuse the viewpoint image with the enhanced image.

25. (Original) The device of Claim 20, wherein the display processor is further operable to utilize data from at least one position sensor to determine the location of the objects with respect to the device.

26. (Original) The device of Claim 20, wherein the display processor is further operable to utilize data from off-board data sources regarding the objects.

27. (Original) The device of Claim 20, wherein the sensor is a video camera.

28. (Original) The device of Claim 23, wherein the second sensor is a RADAR sensor.

29. (Original) The device of Claim 23, wherein the second sensor is a FLIR sensor.

30. (Original) The device of Claim 20, wherein the display processor is further operable to generate a common display area associated with at least two mutually exclusive windows of information on the display device, wherein the common display area can be customized by the operator to display detailed information related to the information displayed in the associated windows.

31. An aircraft, comprising:

a crewstation with cockpit windows;

a first display device for one crewmember;

a second display device for another crewmember;

a first transparent aperture including a conical surface that rotates about the axis of the conical surface;

a first cleaning mechanism configured to clean the first transparent aperture to remove obstructions to a first sensor's field of view; and

a display processor operable to:

receive an image of an out-the-window visual scene from the viewpoint of a first sensor located within a first protective housing and behind a first transparent aperture, wherein a first cleaning mechanism cleans the first transparent aperture to remove obstructions to the first sensor's field of view without interfering with the field of view of the first sensor;

receive another image of a portion of the out-the-window visual scene from the viewpoint of a second sensor located within a second protective housing and behind a second transparent aperture, wherein a second cleaning mechanism cleans the second transparent aperture of the second protective housing to remove

obstructions to the second sensor's field of view without interfering with the field of view of the second sensor;

fuse the images from the first and second sensors into a combined image to generate a first fused image;

transform the fused image to a first operator viewpoint and to a second operator viewpoint;

transform the first operator viewpoint image and the second operator viewpoint image to conform to the size and orientation of the out-the-window visual scene; and

output the first operator viewpoint image to the first display device and the second operator viewpoint image to the second display device.

32. (Original) The aircraft of Claim 31, wherein the display processor is further operable to combine the first fused image with symbols representing the objects and primary flight information for the aircraft.

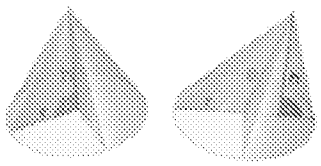
33. (Original) The aircraft of Claim 32, wherein the display processor is further operable to fuse the first fused image with an enhanced image of a portion of the out-the-window scenery from at least one of the group of a RADAR sensor and a FLIR sensor, to generate a second fused image.

IX. EVIDENCE APPENDIX

Cone (geometry)

From Wikipedia, the free encyclopedia

A cone is a three-dimensional geometric shape that tapers smoothly from a flat, round *base* to a point called the *apex* or *vertex*. More precisely, it is the solid figure bounded by a plane base and the surface (called the *lateral surface*) formed by the locus of all straight line segments joining the apex to the perimeter of the base. The term "cone" sometimes refers just to the surface of this solid figure, or just to the lateral surface.



A right circular cone and an oblique circular cone

The *axis* of a cone is the straight line (if any), passing through the apex, about which the lateral surface has a rotational symmetry.

In general, the base may be any shape, and the apex may lie anywhere (though it is often assumed that the base is bounded and has nonzero area, and that the apex lies outside the plane of the base). For example, a *pyramid* is technically a cone with a polygonal base. In common usage in elementary geometry, however, cones are assumed to be *right circular*, where *right* means that the axis passes through the centre of the base (suitably defined) at right angles to its plane, and *circular* means that the base is a circle. Contrasted with right cones are *oblique* cones, in which the axis does not pass perpendicularly through the centre of the base.

Contents

Other mathematical meanings

In mathematical usage, the word "cone" is used also for an *infinite cone*, the union of any set of half-lines that start at a common apex point. This kind of cone does not have a bounding base, and extends to infinity. A *doubly infinite cone*, or *double cone*, is the union of any set of straight lines that pass through a common apex point, and therefore extends symmetrically on both sides of the apex.

The boundary of an infinite or doubly infinite cone is a *conical surface*, and the intersection of a plane with this surface is a *conic section*. For infinite cones, the word *axis* again usually refers to the axis of rotational symmetry (if any). One half of a double cone is called a *nappe*.

Depending on the context, "cone" may also mean specifically a convex cone or a projective cone.

X. RELATED PROCEEDINGS APPENDIX

None.